

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF TEXAS
TYLER DIVISION**

Cheetah Omni LLC,

Plaintiff,

v.

Alcatel-Lucent USA Inc., et al.,

Defendants.

Case No. 6:11-cv-390

AMENDED OPINION AND ORDER

Before the court is a motion for summary judgment of non-infringement filed by defendants Tellabs, Inc., Tellabs Operations, Inc., and Tellabs North America, Inc. (collectively Tellabs). The court held oral argument on the motion on January 23, 2014.

Plaintiff Cheetah Omni LLC (Cheetah) has accused Tellabs of infringing two patents related to control of light polarization in fiber optic communications systems. The asserted claims are claims 1 and 14–17 of U.S. Patent No. 6,856,459 (the '459 patent) and claims 1, 9, 15, 16, 20, 22, 24, and 26 of U.S. Patent No. 6,940,647 (the '647 patent). Tellabs contends it is entitled to a judgment of non-infringement because its products lack two essential elements of the asserted claims—(1) “a partially transmitting mirror” and (2) “a beam splitter that is shared.”¹ Because the undisputed facts show that the accused devices lack “a partially transmitting mirror,” as that term has been construed by this court, no genuine issue of material

¹ Tellabs initially also moved for summary judgment on the ground that its products lacked a third essential claim element, “at least three stages of phase shifters each operable to introduce a phase shift between the first and second principal mode of polarization.” Tellabs later withdrew that part of its motion for summary judgment.

fact exists, and Tellabs is entitled to judgment as a matter of law. Tellabs' motion for summary judgment of non-infringement is therefore **GRANTED**. The court does not reach Tellabs' other asserted ground for summary judgment.

BACKGROUND

The '459 and '647 patents are directed to means of controlling light polarization in fiber optic communications systems. Polarization is the orientation of electric and magnetic fields that make up a given light wave. A single orientation is called a mode. In fiber optic communications systems, where light waves are the medium for transmission of information, polarization has many uses and effects. *See* '459 patent col. 1 l. 25 to col. 2 l. 3 (explaining various uses of polarization control in fiber optic communications systems).²

The asserted claims of the '459 and '647 patents relate to a device called a "polarization controller," which, among other things, can correct for polarization mode dispersion. Polarization mode dispersion is a form of signal degradation that occurs naturally over the length of a fiber optic cable. When an optical signal is sent down a fiber optic cable, it contains two principal modes of polarization. Due to inherent imperfections in the fiber optic materials, the two modes of polarization travel down the cable at different speeds. Over the length of the cable, the faster and slower modes fall out of phase (*i.e.*, out of sync) with one another, making it difficult to recover the information contained in the optical signal. This is known as polarization mode dispersion. A polarization controller corrects for polarization mode dispersion by creating a phase shift between the two modes of polarization, bringing the fast and slow modes back into phase (*i.e.*, back into sync).

Independent claim 1 of the '459 patent is representative of the asserted claims. It reads:

² The '459 and '647 patents share a specification. For simplicity, all citations to the specification are to the '459 patent.

1. A polarization controller, comprising:

a first polarization beam splitter operable to receive an input optical signal having an input state of polarization and to separate the signal into a first and a second principal mode of polarization; and

at least three stages of phase shifters each operable to introduce a phase shift between the first and second principal modes, at least one phase shifter comprising a beam splitter that is shared with at least one other of the phase shifters, the at least three stages of phase shifters comprising a first stage coupled to the first polarization beam splitter and a last stage coupled to a second polarization beam splitter, *wherein the beam splitter that is shared comprises a partially transmitting mirror*;

wherein the second polarization beam splitter is operable to receive phase shifted copies of the first and second principal modes, and to align the phase shifted copies of the principal modes to an output state of polarization.

'459 patent col. 46 ll. 7–25 (emphasis added). The emphasized portion is the disputed element here. The other independent claims differ slightly, but also require “a beam splitter that is shared” and “a partially transmitting mirror.”³ The dependent claims add further limitations that are not relevant here.

³ '459 patent claim 17 recites a method with very similar limitations to the polarization controller of claim 1. The full text of claim 17 reads:

17. A method of controlling the state of polarization of an optical signal, the method comprising:

receiving an optical signal having an input state of polarization;

separating the optical signal into a first principal mode of polarization and a second principal mode of polarization; and

introducing at least three stages of phase shift between the first and second modes of polarization to align the first and second modes of polarization with a desired output state of polarization;

wherein each of the at least three stages of phase shift are introduced by one of at least three phase shift stages, at least one phase shift stage sharing a beam splitter with at least one other phase shift stage, *wherein the beam splitter that is sha[r]ed comprises a partially transmitting mirror*.

The accused Tellabs products are several models of reconfigurable optical add/drop multiplexers (ROADMs), each of which contains a wavelength selective switch manufactured by a nonparty, CoAdna Photonics, Inc. (CoAdna). Although Cheetah acknowledges that a wavelength selective switch is a different device than a polarization controller, Oral Arg. 24:16, Jan. 23, 2014, ECF No. 421, it argues that the two use similar optical components and that the Tellabs devices meet each limitation of the asserted claims. At an earlier stage of the case, Tellabs argued that the preambles of the claims should be construed to limit infringement to polarization controllers or methods of controlling polarization. '459 patent col. 46 l. 7 ("polarization controller"); *id.* col 47. ll. 39–40 ("method of controlling the state of polarization

'459 patent col. 47 ll. 39–55 (emphasis added). Although this court has construed "sharing a beam splitter" in '459 patent claim 17 differently than the parallel language in '459 patent claim 1, Claim Constr. Order 38-40, ECF No. 325, the difference is irrelevant to the grant of summary judgment because the court does not reach that issue. The element of "a partially transmitting mirror" is the sole basis for summary judgment. That language has been construed identically for all claims. *Id.* 40-42.

'647 patent claim 1 recites a system that includes a polarization controller similar to '459 patent claim 1. The relevant text of '647 patent claim 1 reads:

[A] polarization adjustment device comprising:

a first polarization beam splitter operable to receive the at least a portion of the first part of the optical signal and to separate the at least a portion of the first part of the optical signal into a first and a second principal mode of polarization; and

at least three stages of phase shifters each operable to introduce a phase shift between the first and second principal modes, at least one phase shifter comprising a second beam splitter that is shared with at least one other of the phase shifters, the at least three stages of phase shifters comprising a first stage coupled to the first polarization beam splitter and a second stage coupled to a second polarization beam splitter, *wherein the second beam splitter that is shared comprises a partially transmitting mirror*

'647 patent col. 46 ll. 20–42 (emphasis added).

of an optical signal”); ’647 patent col. 46 l. 19–20 (“polarization adjustment device”). This court rejected that argument and held that the preambles were not limiting. *See* Claim Constr. Order 29–31. Thus, the only issue here is whether the accused devices fulfill the elements of the claims, as Cheetah contends.

The asserted claims recite polarization controllers that introduce the desired phase shift between polarization modes in three stages. In all of the asserted claims, at least one of the phase shift stages must share a “beam splitter” with one of the other phase shift stages, and that beam splitter must be a “partially transmitting mirror.” *See* ’459 patent col. 46 ll. 14–16, 19–21; *id.* col. 47 ll. 51–55; ’647 patent col. 46 ll. 29–31, 35–36. This court has construed “a beam splitter” to mean “a device that passes a first copy of an optical signal in one direction and a second copy of the optical signal in another direction.” Claim Constr. Order 38. The patents explain that a beam splitter generally “may comprise a partially silvered mirror . . . a mirror having one or more layers of a dielectric coating . . . [or] a fiber coupler.” *See* ’459 patent col. 9 ll. 22–26. In the asserted claims, however, the shared beam splitter must comprise “a partially transmitting mirror.” ’459 patent col. 46 ll. 19–21; *id.* col. 47 ll. 53–55; ’647 patent col. 46 l. 35–36. The court has construed “a partially transmitting mirror” to mean “a surface or collection of surfaces that both reflects and transmits the incident [incoming] optical signal.” Claim Constr. Order 42.

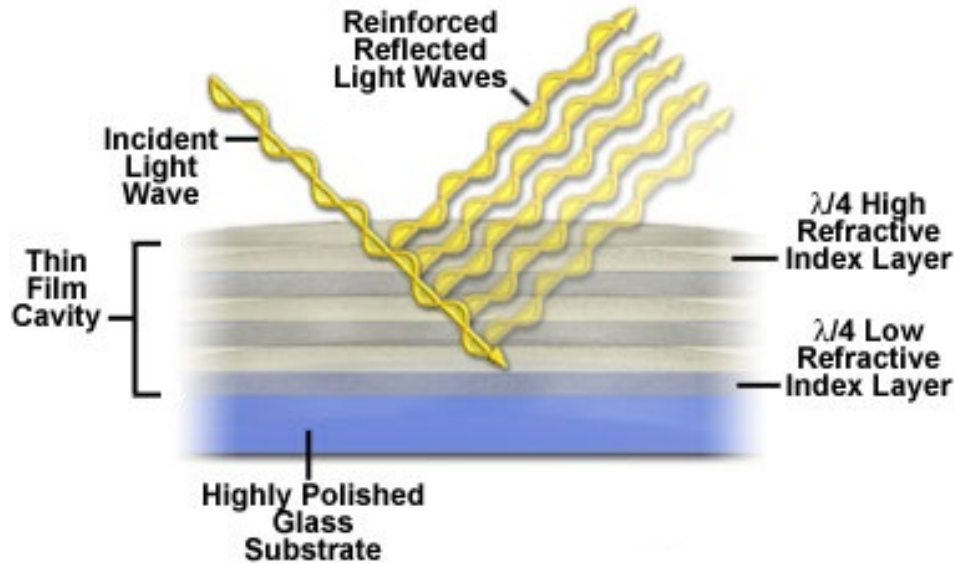
Cheetah accuses Tellabs only of literal infringement.⁴ The part of the Tellabs devices that Cheetah identifies as a “partially transmitting mirror” is a dielectric mirror—what the patents refer to as “a mirror having one or more layers of a dielectric coating.” ’459 patent col. 9 ll. 24–25. There is no dispute as to what a dielectric mirror is or how it functions. As shown by the following figure used by Cheetah, each layer of a dielectric mirror is partially reflective; it

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Cheetah does not allege infringement under the doctrine of equivalents.

reflects some light and transmits some light to the next layer. But the mirror as a whole can be made fully reflective if the thickness and refractivity of each layer is carefully tailored to the wavelength of incoming light. When the mirror is so constructed, the light reflected from each layer will constructively interfere with and reinforce the reflected light from each other layer. The result is that the mirror as a whole is fully reflective and transmits little or no light. A dielectric mirror can also be made less than fully reflective of a given wavelength of light, so as to transmit some of the light through the mirror to the other side.

Figure 1. A dielectric mirror.



The parties agree that the dielectric mirrors in Tellabs' products, taken as a whole, are fully reflective. CoAdna's technical specifications require that the mirrors reflect at least 99.5% of the incident light, Ex. 3 to Tellabs' Mot. Summ. J. 2, Oct. 24, 2013, ECF No. 345-3, and CoAdna's Chief Technology Officer testified that the mirrors are "fully reflective of the [infrared] optical beams used" in fiber optic communications systems. Ex. 1 to Tellabs' Mot. Summ. J. 2, Oct. 24, 2013, ECF No. 345-1. Cheetah does not dispute that the mirrors in the accused devices are fully reflective, and it confirmed at oral argument that it does not allege the

“tiny amount [of light] that would pass through” the accused mirrors makes them “partially transmitting.” Oral Arg. 39:45. Nonetheless, Cheetah contends that the accused devices satisfy the claim limitations.

DISCUSSION

Summary judgment is appropriate “if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law.” Fed. R. Civ. P. 56(a). In patent cases, the burden of proving infringement by a preponderance of the evidence is on the patentee. *Medtronic, Inc. v. Mirowski Family Ventures, LLC*, No. 12-1228, 571 U.S. ___, 2014 WL 223040, at *6 (Jan. 22, 2014). Thus, summary judgment of non-infringement is appropriate if, “on the correct claim construction, no reasonable jury could [find] infringement on the undisputed facts or when all factual inferences are drawn in favor of the patentee.” *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1353 (Fed. Cir. 2001).

The facts are not in dispute here. Both sides agree that Tellabs’ mirrors are fully reflective as a whole, but that each individual layer of dielectric material is partially transmitting and both reflects and transmits the incident optical signal. The only question is whether a mirror so described is within this court’s construction of the term “partially transmitting mirror.” Whether this question is described as one of supplemental claim construction or the sufficiency of the undisputed facts to establish non-infringement, it is ripe for summary judgment.

Giving a generous construction to Cheetah’s arguments it appears that Cheetah is—or may be—making three separate arguments. Cheetah first contends that the specification mentions a dielectric mirror as being a type of partially transmitting mirror, and that by definition any dielectric mirror is a partially transmitting mirror. In other words, Cheetah asks this court to construe “partially transmitting mirror” to include all dielectric mirrors. The court declines to

adopt that construction. Since the patent does not define “partially transmitting mirror,” it must be given its ordinary and customary meaning—a mirror that both reflects and transmits incident light. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Cheetah would depart from the ordinary and customary meaning of “a partially transmitting mirror” by including all dielectric mirrors regardless of whether they have the function of both reflecting and transmitting light. The accused mirrors here effectively do not transmit light at all.

Moreover, this court already rejected that construction in its claim construction order. Cheetah initially proposed that “a partially transmitting mirror” be construed as “a surface or collection of surfaces that both reflects and transmits the incident optical signal, *such as a partially silvered mirror or a mirror made from one or more layers of a dielectric coating.*” Claim Constr. Order 40–41 (emphasis added). In other words, Cheetah proposed the same argument it now presses: all dielectric mirrors are partially transmitting mirrors by definition. This court rejected Cheetah’s argument, stating:

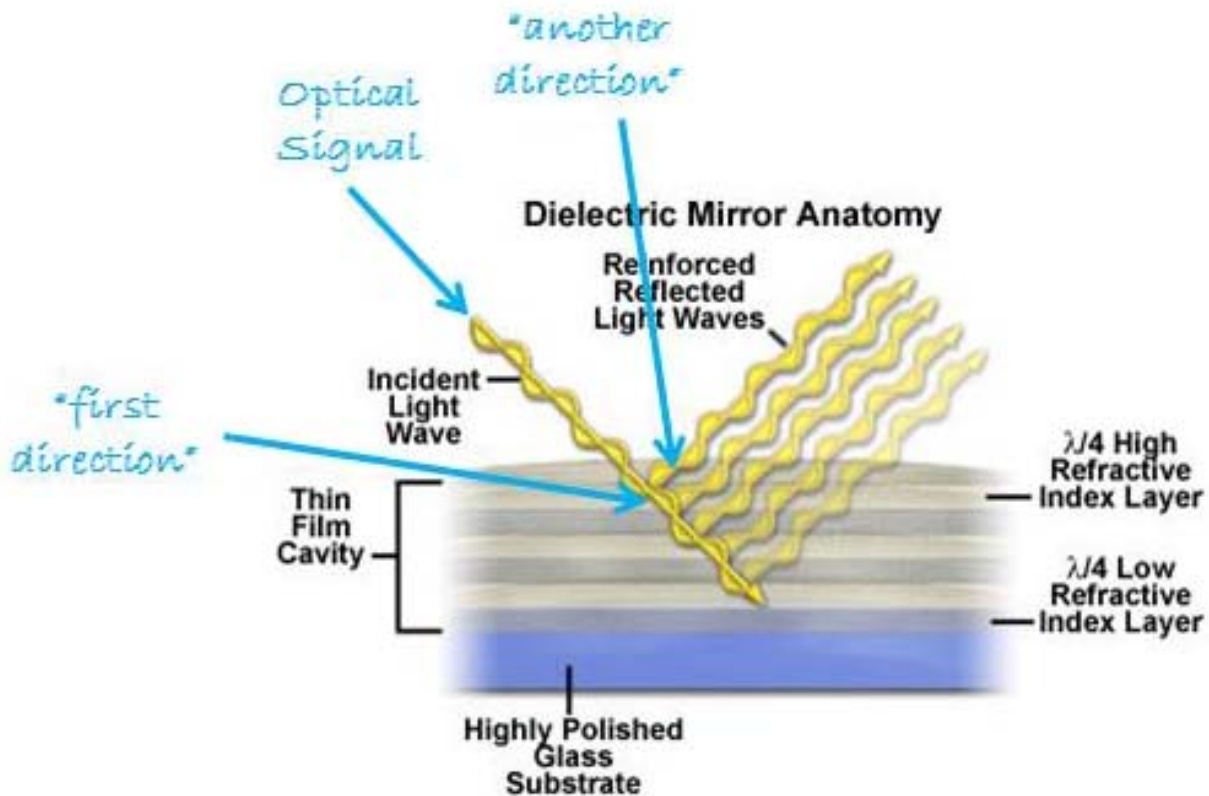
The specification discloses partially silvered mirrors and mirrors made from one or more layers of a dielectric coating as examples of partially transmitting mirrors. However, there is no requirement that either of these comply with the required functionality of partially transmitting the optical signal. *If, for example, a partially silvered mirror does not transmit some of the optical signal, it would not satisfy the Claim language. The proper test is whether the partially silvered mirror both reflects and transmits the incident optical signal, regardless of its name.*

Id. at 42 (emphasis added) (internal citations omitted). This gloss on the claim construction plainly forecloses Cheetah’s argument. The mere fact that a mirror is composed of layers of dielectric material does not make it “partially transmitting,” unless it satisfies a functional description. Rather, “[t]he proper test is whether the [dielectric mirror] both reflects and transmits the incident optical signal, regardless of its name.” *Id.* Cheetah conceded at oral argument that a dielectric mirror *could* be made to transmit some of the incident optical signal,

Oral Arg. 39:32, but the mirrors here were not. The court declines Cheetah's invitation to revisit the settled claim construction, which in any event was correct.

Cheetah's second argument appears to be that each layer is a separate mirror. Cheetah's expert witness on infringement, Dr. Michael Lebby, explained that "each surface in the dielectric coating splits the optical signal such that a first copy of the optical signal is transmitted in a one [sic] direction (through the surface) and a second copy another direction (reflected off the surface)." Ex. F to Cheetah's Br. Opp. Tellabs' Mot. Summ. J. ¶ 83, Nov. 14, 2013, ECF No. 359-7 ("Lebby Expert Report"). Cheetah seems to take that explanation to mean that each layer is a separate partially transmitting mirror. This theory is reflected in the following diagram from Dr. Lebby's expert report on infringement:

Figure 2. Cheetah's infringement theory.



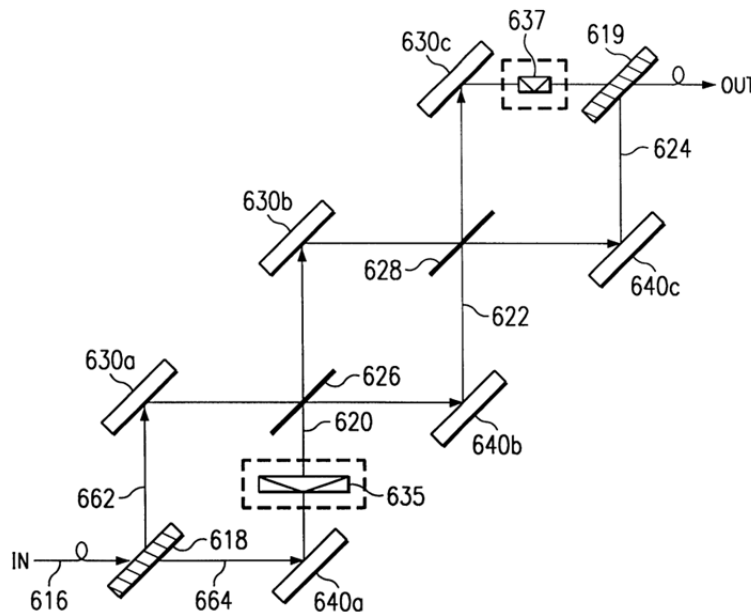
Again, Cheetah's proposed theory is a revised claim construction in which the individual layers of a dielectric mirror are separate mirrors because each one is "partially transmitting," even though the mirror as a whole is not. This proposed revision is without support. Tellabs' expert, Dr. Chiao, explained that

Dr. Lebby's analysis [in Figure 2 above] improperly focuses on a single surface rather than the overall structure. By focusing on each individual surface, Dr. Lebby's analysis turns what is in fact a *single* device, the LC mirror, into a sequence or plurality of purported devices—a sequence of plurality of purported partially transmitting mirrors. For this reason, Dr. Lebby's analysis ignores how a POSITA [person of ordinary skill in the art] would understand the LC mirror. . . . [A]s understood by a POSITA, the LC mirror is a single device, and therefore must be analyzed at the overall LC mirror device level.

Ex. 6 to Tellabs' Mot. Summ. J. ¶ 98, Oct. 24, 2013, ECF No. 345-6. Moreover, Dr. Lebby—Cheetah's own expert—backed away from suggesting that each layer is an individual mirror. Initially, when asked at a deposition whether "a dielectric mirror[] is a sequence of partially transmitting mirrors," Dr. Lebby responded, "Well, the way I've described it, I believe this answers your question, is that *a surface or a layer is a partially transmitting mirror.*" Ex. 4 to Tellabs' Mot. Summ. J. Tr. 90:16–21, Oct. 24, 2013, ECF No. 345-4 ("Lebby Dep.") (emphasis added). Later, when asked directly whether he viewed each layer as "an individual partially transmitting mirror," Dr. Lebby testified, "I don't believe each individual layer is a mirror." *Id.* 183:23–184:2. He explained, "[W]hat I'm referring to as a partially transmitting mirror is the—what's depicted on here as the thin film cavity, which is all of the layers of surfaces." *Id.* 184:4–6. Dr. Lebby dispelled any lingering ambiguity when he was asked a second time, "So in your opinion the whole collection of surfaces labeled thin film cavity corresponds to the partially transmitting mirror; correct?" and he responded, "That's correct, yeah." *Id.* 184:7–10. Thus, the experts for both sides agreed that the individual layers of a dielectric mirror are not separate mirrors.

Cheetah's third theory is that the Tellabs mirror is a partially transmitting mirror because it partially transmits light within the different layers of the mirror. In other words, Cheetah asks this court to construe the claims as not requiring signal transmission outside the mirror itself. But the entire objective of the partially transmitting mirror is to split the beam by transmitting one copy of the signal away from the surface of the mirror and to allow a separate signal to pass through the mirror to another portion of the phase shifter. Nothing in the specification depicts anything like Figure 2 above or in any way suggests that "transmitting" light can be accomplished simply by allowing light to pass from one layer to the next of a dielectric mirror. Rather, the specification depicts only beam splitters in which the light passes through one side of the mirror to the other. The following figure is representative:

Figure 3. Figure 7b from the specification.



'459 patent fig. 7b. The beam splitters in the figure are labeled **626** and **628**. *Id.* col. 21 l. 43. As the figure shows, each of the beam splitters transmits light from one side of the device to the other. The devices that only reflect light—marked **630a**, **630b**, **630c**, **640a**, **640b**, and **640c**—are

not labeled beam splitters, but simply “[m]irrors.” *Id.* col 21 l. 38. If beam splitter **626** were a fully reflective dielectric mirror, the device would not function properly. All the light from mirror **630a** would be reflected to mirror **630b**, rather than being split between mirrors **630b** and **640b**, and it would make no difference whether the light from mirror **630a** was partially transmitted within the individual layers of the dielectric mirror. The beam splitter must reflect some light and transmit some light all the way through the mirror so that the two copies of the incident optical signal travel different paths. Tellabs’ mirrors would not do that. Cheetah’s own expert, Dr. Lebby, testified that in Figure 2 above “no signal is being shown to exit” the mirror. Lebby Dep. 89:25–90:5. The mirrors claimed to be “partially transmitting mirror[s]” therefore are not partially transmitting.

CONCLUSION

The undisputed facts show that Tellabs’ products do not contain “a partially transmitting mirror” as that term has been construed by this court. Consequently, the products do not infringe any asserted claim of the ’459 and ’647 patents. The court need not address Tellabs’ other arguments because the absence of any essential element is enough to defeat a claim of infringement. *Cimiotti Unhairing Co. v. American Fur Refining Co.*, 198 U.S. 399, 410 (1905); *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1330 (Fed. Cir. 2001). Tellabs’ motion for summary judgment of non-infringement is **GRANTED**.

Because Cheetah’s separate claims against Tellabs under U.S. Patent No. 6,847,479 have been stayed indefinitely, *see* Order Partially Staying Case, ECF. No. 186, and because Cheetah’s claims against the remaining defendants are separate from those against Tellabs, the court finds there is no just reason for delay, and the grant of summary judgment shall be a final judgment as to Cheetah’s claims against Tellabs under the ’459 and ’647 patents. *See* Fed. R. Civ. P. 54(b).

Signed and ordered February 21, 2014.

A handwritten signature in black ink, appearing to read "Tim B. Dyk", written over a horizontal line.

Hon. Timothy B. Dyk
United States Circuit Judge^{*}

^{*} Of the United States Court of Appeals for the Federal Circuit, sitting by designation.